## DT09 Rec'd PCT/PT0 2.8 SEP 2004

## SEQUENCE LISTING

<110> KUMIAI CHEMICAL INDUSTRY CO., LTD
National Institute of Agrobiological Sciences

 $\langle 120 \rangle$  A gene coding for aceto-lactate-sythetase

<130> PH-1733-PCT

<150> JP 2002-95721

<151> 2002-03-29

<160> 34

<170> PatentIn Ver. 2.0

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<211> 2301

<212> DNA

<213> Oryza sativa var. kinmaze

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<221> CDS

<222> (48).. (1979)

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Lou	Lou	Lou	۸1.	Dho	G1 v	Val	120	Dho	\ an	Aan	Arc	Vol	Thr	C1	I	

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Pro Val Thr Pro Pro Ser Pro Ala Pro Pro Ala Thr Pro Leu Arg Pro 50 55 60

Trp Gly Pro Ala Glu Pro Arg Lys Gly Ala Asp Ile Leu Val Glu Ala
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Leu Glu Arg Cys Gly Val Ser Asp Val Phe Ala Tyr Pro Gly Gly Ala

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Ser Met Glu Ile His Gln Ala Leu Thr Arg Ser Pro Val Ile Thr Asn 100 105 110

His Leu Phe Arg His Glu Gln Gly Glu Ala Phe Ala Ala Ser Gly Tyr 8/56 115 120 125

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Gly Ala Thr Asn Leu Val Ser Ala Leu Ala Asp Ala Leu Leu Asp Ser 145 150 155 160

Val Pro Met Val Ala Ile Thr Gly Gln Val His Ser Arg Met Ile Gly

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Thr Asp Ala Phe Gln Glu Thr Pro Ile Val Glu Val Thr Arg Ser Ile 180 185 190

Thr Lys His Asn Tyr Leu Val Leu Asp Val Glu Asp Ile Pro Arg Val
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Ile Gln Glu Ala Phe Phe Leu Ala Ser Ser Gly Arg Pro Gly Pro Val 210 215 220

Leu Val Asp Ile Pro Lys Asp Ile Gln Gln Gln Met Ala Val Pro Val 225 230 235 240

Trp Asp Thr Ser Met Asn Leu Pro Gly Tyr Ile Ala Arg Leu Pro Lys

245

250

255

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Lys	Ala	Asp	Leu 340	Leu	Leu	Ala	Phe	Gly 345	Val	Arg	Phe	Asp	Asp 350	Arg	Val
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Ile 385	Cys	Ala	Asp	Val	Lys 390	Leu	Ala	Leu	Gln	Gly 395	Leu	Asn	Ala	Leu	Leu 400
G1n	Gln	Ser	Thr	Thr 405	Lys	Thr	Ser	Ser	Asp 410	Phe	Ser	Ala	Trp	His 415	Asn
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425

10/56

430

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450 455 460

Trp Ala Ala Gln Tyr Tyr Thr Tyr Lys Arg Pro Arg Gln Trp Leu Ser 465 470 475 480

Ser Ala Gly Leu Gly Ala Met Gly Phe Gly Leu Pro Ala Ala Ala Gly
485 490 495

Ala Ser Val Ala Asn Pro Gly Val Thr Val Val Asp Ile Asp Gly Asp
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Gly Ser Phe Leu Met Asn Ile Gln Glu Leu Ala Leu Ile Arg Ile Glu
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Asn Leu Pro Val Lys Val Met Val Leu Asn Asn Gln His Leu Gly Met
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Val Val Gln Trp Glu Asp Arg Phe Tyr Lys Ala Asn Arg Ala His Thr 545 550 555 560

Tyr Leu Gly Asn Pro Glu Cys Glu Ser Glu Ile Tyr Pro Asp Phe Val
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Ser Glu Val Arg Ala Ala Ile Lys Lys Met Leu Glu Thr Pro Gly Pro
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<213> Oryza sativa var. kinmaze

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<400> 3

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Leu Leu Leu Ala Phe Gly Val Arg Phe Asp Asp Arg Val Thr Gly Lys

att	gag	gct	ttt	gca	agc	agg	gcc	aag	att	gtg	cac	att	gac	att	gat	1160
Ile	Glu	Ala	Phe	Ala	Ser	Arg	Ala	Lys	Ile	Val	His	Ile	Asp	Ile	Asp	
				360					365					370		
						-										-
cca	gca	gag	att	gga	aag	aac	aag	caa	cca	cat	gtg	tca	att	tgc	gca	1208
Pro	Ala	Glu	Ile	Gly	Lys	Asn	Lys	Gln	Pro	His	Val	Ser	Ile	Cys	Ala	
			375					380					385			
gat	gtt	aag	ctt	gct	tta	cag	ggc	ttg	aat	gct	ctg	cta	caa	cag	agc	1256
Asp	Val	Lys	Leu	Ala	Leu	Gln	Gly	Leu	Asn	Ala	Leu	Leu	G1n	Gln	Ser	
		390					395					400				
aca	aca	aag.	aca	agt	tct	gat	ttt	agt	gca	tgg	cac	aat	gag	ttg	gac	1304
Thr	Thr	Lys	Thr	Ser	Ser	Asp	Phe	Ser	Ala	Trp	His	Asn	Glu	Leu	Asp	
	405					410					415					
			-													
cag	cag	aag	agg	gag	ttt	cct	ctg	ggg	tac	aaa	act	ttt	ggt	gaa	gag	1352
Gln	Gln	Lys	Arg	Glu	Phe	Pro	Leu	Gly	Tyr	Lys	Thr	Phe	Gly	Glu	Glu	
420					425					430					435	
atc	cca	ccg	caa	tat	gcc	att	cag	gtg	ctg	gat	gag	ctg	acg	aaa	ggt	1400
Ile	Pro	Pro	Gln	Tyr	Ala	Ile	Gln	Val	Leu	Asp	G1u	Leu	Thr	Lys	Gly	
				440					445					450		
gag	gca	atc	atc	gct	act	ggt	gt.t	ggg	cag	cac	cag	atg	tgg	gcg	gca	1448
Glu	Ala	Ile	Ile	Ala	Thr	Gly	Val	Gly	Gln	His	Gln	Met	Trp	Ala	Ala	
			455					460					465			

caa	tat	tac	acc	tac	aag	cgg	cca	cgg	cag	tgg	ctg	tct	tcg	gct	ggt	1496
G1n	Tyr	Tyr	Thr	Tyr	Lys	Arg	Pro	Arg	Gln	Trp	Leu	Ser	Ser	Ala	Gly	
		470					475					480				
ctg	ggc	gca	atg	gga	ttt	ggg	ctg	cct	gct	gca	gct	ggt	gct	tct	gtg	1544
Leu	Gly	Ala	Met	Gly	Phe	Gly	Leu	Pro	Ala	Ala	Ala	Gly	Ala	Ser	Val	
	485					490					495					
gct	aac	cca	ggt	gtc	aca	gtt	gtt	gat	att	gat	ggg	gat	ggt	agc	ttc	1592
Ala	Asn	Pro	Gly	Val	Thr	Val	Val	Asp	Ile	Asp	Gly	Asp	Gly	Ser	Phe	
500					505					510					515	
ctc	atg	aac	att	cag	gag	ctg	gca	ttg	atc	cgc	att	gag	aac	ctc	cct	1640
Leu	Met	Asn	Ile	Gln	Glu	Leu	Ala	Leu	Ile	Arg	Ile	Glu	Asn	Leu	Pro	
				520					525					530		
gtg	aag	gtg	atg	gtg	ttg	aac	aac	caa	cat	ttg	ggt	atg	gtg	gtg	caa	1688
Val	Lys	Val	Met	Val	Leu	Asn	Asn	Gln	His	Leu	Gly	Met	Val	Val	Gln	
			535					540					545			
ttg													,		aa0	1736
	gag	gat	agg	ttt	tac	aag	gcg	aat	agg	gcg	cat	aca	tac	ττg	ggc	
Leu	-	_				aag Lys								_		2.00
Leu	-	_												_		2,00
Leu	-	Asp					Ala					Thr		_		1.00
	Glu	Asp 550	Arg	Phe	Tyr		Ala 555	Asn	Arg	Ala	His	Thr 560	Tyr	Leu	Gly	1784
aac	Glu	Asp 550 gaa	Arg	Phe gag	Tyr	Lys	Ala 555	Asn	Arg	Ala	His ttt	Thr 560 gtg	Tyr	Leu	Gly	
aac	Glu	Asp 550 gaa	Arg	Phe gag	Tyr	Lys	Ala 555	Asn	Arg	Ala	His ttt	Thr 560 gtg	Tyr	Leu	Gly	
aac	Glu ccg Pro	Asp 550 gaa	Arg	Phe gag	Tyr	Lys gag Glu	Ala 555	Asn	Arg	Ala	His ttt Phe	Thr 560 gtg	Tyr	Leu	Gly	

aag ggg ttc aat att cct gca gtc cgt gta aca aag aag agt gaa gtc \$1832\$ \$17/56\$

Lys	Gly	Phe	Asn	Ile	Pro	Ala	Val	Arg	Val	Thr	Lys	Lys	Ser	Glu	Val	
580					585					590					595	
cgt	gcc	gcc	atc	aag	aag	atg	ctc	gag	act	cca	ggg	cca	tac	ttg	ttg	1880
Arg	Ala	Ala	Ile	Lys	Lys	Met	Leu	Glu	Thr	Pro	Gly	Pro	Tyr	Leu	Leu	
				600					605					610		
gat	atc	atc	gtc	ccg	cac	cag	gag	cat	gtg	ctg	cct	atg	atc	cca	agt	1928
														Pro		
			615					620					625			
ggg	ggc	gca	ttc	aag	gac	atg	atc	ctg	gat	ggt	gat	ggc	agg	act	gtg	1976
														Thr		
•	•	630		•	•		635		-	·	•	640	Ü			
tat	taat	ctai	taa t	ctgt	atgt	t gg	caaa	gcac	cag	CCCE	gcc	tatg	zttts	gac		2029
Tyr				Ü	Ū			J		, .	, 0		, .	-		
- , -																
ctga	atga	acc (	cataa	aagag	rt gg	tate	ccta	tga	tgtt	tgt	atgt	gete	eta t	caat	aacta	2089
0 0 0 0			<i>-</i>		, 60	,	, • • • •				4080		, , , ,	Jour	, aao va	2000
aggt	etca	aac 1	tatos	nacca	it at	gete	ttct	gt.t	ttac	t.t.g	ttte	atøt	ec t	tøøc	atggt	2149
466	, 5 000	iuo i	uuuge	iuooc	i c a c	,8000	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	800	oud	,,,,,	0008	,	, 50 (	, , , ,	,40550	2143
aato	ctas	1++ 2	agett	cete	ic to	rteta	aatt	† a†	aata	·tat	t a t t	t	at s	aaca	tatgc	2200
aatt	cuae	166 6	agett	.0008	,c ce	,	iggii	. ugu	agug	, ug u	tgtt		g c	iggca	latge	2209
2+22		rat d	a+ o a +	atos	·	+ 0 + +	at oo	t a a	2+2+	000	toot	2240		+000	at a a t	2260
acca	ıcaab	sat è	ιιυαι	guac	ig il	,	gicc	tac	alal	caa	ıaal	aaga	iga a	ıcaad	gtact	4409
4																0000
ccta	tgca	iaa a	aaaaa	ıaaaa	ia aa	ıaaaa	aaaa	a								2300

<210> 4 <211> 644 <212> PRT <213> Oryza sativa var. kinmaze <400> 4 Met Ala Thr Thr Ala Ala Ala Ala Ala Ala Leu Ser Ala Ala Ala Thr Ala Lys Thr Gly Arg Lys Asn His Gln Arg His His Val Leu Pro Ala Arg Gly Arg Val Gly Ala Ala Ala Val Arg Cys Ser Ala Val Ser Pro Val Thr Pro Pro Ser Pro Ala Pro Pro Ala Thr Pro Leu Arg Pro Trp Gly Pro Ala Glu Pro Arg Lys Gly Ala Asp Ile Leu Val Glu Ala Leu Glu Arg Cys Gly Val Ser Asp Val Phe Ala Tyr Pro Gly Gly Ala Ser Met Glu Ile His Gln Ala Leu Thr Arg Ser Pro Val Ile Thr Asn His Leu Phe Arg His Glu Gln Gly Glu Ala Phe Ala Ala Ser Gly Tyr

Ala Arg Ala Ser Gly Arg Val Gly Val Cys Val Ala Thr Ser Gly Pro Gly Ala Thr Asn Leu Val Ser Ala Leu Ala Asp Ala Leu Leu Asp Ser Val Pro Met Val Ala Ile Thr Gly Gln Val His Arg Arg Met Ile Gly Thr Asp Ala Phe Gln Glu Thr Pro Ile Val Glu Val Thr Arg Ser Ile Thr Lys His Asn Tyr Leu Val Leu Asp Val Glu Asp Ile Pro Arg Val Ile Gln Glu Ala Phe Phe Leu Ala Ser Ser Gly Arg Pro Gly Pro Val Leu Val Asp Ile Pro Lys Asp Ile Gln Gln Met Ala Val Pro Val 

Trp Asp Thr Ser Met Asn Leu Pro Gly Tyr Ile Ala Arg Leu Pro Lys
245
250
255

Pro Pro Ala Thr Glu Leu Leu Glu Gln Val Leu Arg Leu Val Gly Glu 260 265 270

Ser Arg Arg Pro Ile Leu Tyr Val Gly Gly Gly Cys Ser Ala Ser Gly 20/56

Asp	Glu	Leu	Arg	Trp	Phe	Val	Glu	Leu	Thr	Gly	Ile	Pro	Val	Thr	Thr
	290					295					300				

Thr Leu Met Gly Leu Gly Asn Phe Pro Ser Asp Asp Pro Leu Ser Leu 305 310 315 320

Arg Met Leu Gly Met His Gly Thr Val Tyr Ala Asn Tyr Ala Val Asp
325 330 335

Lys Ala Asp Leu Leu Leu Ala Phe Gly Val Arg Phe Asp Asp Arg Val
340 345 350

Thr Gly Lys Ile Glu Ala Phe Ala Ser Arg Ala Lys Ile Val His Ile 355 360 365

Asp Ile Asp Pro Ala Glu Ile Gly Lys Asn Lys Gln Pro His Val Ser 370 375 380

Ile Cys Ala Asp Val Lys Leu Ala Leu Gln Gly Leu Asn Ala Leu Leu 385 390 395 400

Gln Gln Ser Thr Thr Lys Thr Ser Ser Asp Phe Ser Ala Trp His Asn
405
410
415

Glu Leu Asp Gln Gln Lys Arg Glu Phe Pro Leu Gly Tyr Lys Thr Phe
420 425 430

Gly	Glu	Glu 435	Ile	Pro	Pro	Gln	Tyr 440	Ala	Ile	Gln	Val	Leu 445	Asp	Glu	Leu
Thr	Lys 450	Gly	Glu	Ala	Ile	Ile 455	Ala	Thr	Gly	Val	Gly 460	Gln	His	Gln	Met
Trp 465	Ala	Ala	Gln	Tyr	Tyr 470	Thr	Tyr	Lys	Arg	Pro 475	Arg	Gln	Trp	Leu	Ser 480
Ser	Ala	Gly	Leu	Gly 485	Ala	Met	G1y	Phe	Gly 490	Leu	Pro	Ala	Ala	Ala 495	Gly
Ala	Ser	Val	Ala 500	Asn	Pro	Gly	Val	Thr 505	Val	Val	Asp	Ile	Asp 510	Gly	Asp
Gly	Ser	Phe 515	Leu	Met	Asn	Ile	Gln 520	Glu	Leu	Ala	Leu	Ile 525	Arg	Ile	Glu .
Asn	Leu 530	Pro	Val	Lys	Val	Met 535	Val	Leu	Asn	Asn	G1n 540	His	Leu	Gly	Met
Val 545	Val	Gln	Leu	Glu	Asp 550	Arg	Phe	Tyr	Lys	Ala 555	Asn	Arg	Ala	His	Thr 560
Tyr	Leu	Gly	Asn	Pro 565	Glu	Cys	Glu	Ser	G1u 570	Ile	Tyr	Pro	Asp	Phe 575	Val

Thr Ile Ala Lys Gly Phe Asn Ile Pro Ala Val Arg Val Thr Lys Lys

Ser Glu Val Arg Ala Ala Ile Lys Lys Met Leu Glu Thr Pro Gly Pro 595 600 605

Tyr Leu Leu Asp Ile Ile Val Pro His Gln Glu His Val Leu Pro Met 610 615 620

Ile Pro Ser Gly Gly Ala Phe Lys Asp Met Ile Leu Asp Gly Asp Gly 625 630 635 640

Arg Thr Val Tyr

<210> 5

<211> 2294

<212> DNA

<213> Oryza sativa var. kinmaze

<220>

<221> CDS

<222> (48).. (1979)

<400> 5

cccaaaccca gaaaccctcg ccgccgccgc cgccgccacc acccacc atg gct acg 56

Met Ala Thr

Thr	Ala	Leu	Ser	Ala	Ala	Ala	Thr	Ala	Lys							
	5					10					15					
acc	ggc	cgt	aag	aac	cac	cag	cga	cac	cac	gtc	ctt	ccc	gct	cga	ggc	152
Thr	Gly	Arg	Lys	Asn	His	Gln	Arg	His	His	Val	Leu	Pro	Ala	Arg	Gly	
20					25					30					35	
cgg	gtg	ggg	gcg	gcg	gcg	gtc	agg	tgc	tcg	gcg	gtg	tcc	ccg	gtc	acc	200
Arg	Val	Gly	Ala	Ala	Ala	Val	Arg	Cys	Ser	Ala	Val	Ser	Pro	Val	Thr	
				40					45					50		
ccg	ccg	tcc	ccg	gcg	ccg	ccg	gcc	acg	ccg	ctc	cgg	ccg	tgg	ggg	ccg	248
Pro	Pro	Ser	Pro	Ala	Pro	Pro	Ala	Thr	Pro	Leu	Arg	Pro	Trp	Gly	Pro	
			55					60					65			
								•							•	
gcc	gag	ссс	cgc	aag	ggc	gcg	gac	atc	ctc	gtg	gag	gcg	ctg	gag	cgg	296
Ala	Glu	Pro	Arg	Lys	Gly	Ala	Asp	Ile	Leu	Val	Glu	Ala	Leu	Glu	Arg	
		70					75					80				
tgc	ggc	gtc	agc	gac	gtg	ttc	gcc	tac	ccg	ggc	ggc	gcg	tcc	atg	gag	344
Cys	Gly	Val	Ser	Asp	Val	Phe	Ala	Tyr	Pro	Gly	Gly	Ala	Ser	Met	Glu	
	85					90					95					
atc	cac	cag	gcg	ctg	acg	cgc	tcc	ccg	gtc	atc	acc	aac	cac	ctc	ttc	392
Ile	His	Gln	Ala	Leu	Thr	Arg	Ser	Pro	Val	Ile	Thr	Asn	His	Leu	Phe	
100					105					110					115	
cgc	cac	gag	cag	ggc	gag	gcg	ttc	gcg	gcg	tcc	ggg	tac	gcg	cgc	gcg	440
Arg	His	Glu	Gln	Glv	Glu	Ala	Phe	Ala	Ala	Ser	Glv	Tvr	Ala	Arø	Ala	

24/56

tcc	ggc	cgc	gtc	ggg	gtc	tgc	gtc	gcc	acc	tcc	ggc	ccc	ggg	gca	acc	488
Ser	Gly	Arg	Val	Gly	Val	Cys	Val	Ala	Thr	Ser	Gly	Pro	Gly	Ala	Thr	
			135					140					145			
aac	ctc	gtg	tcc	gcg	ctc	gcc	gac	gcg	ctg	ctc	gac	tcc	gtc	ccg	atg	536
Asn	Leu	Val	Ser	Ala	Leu	Ala	Asp	Ala	Leu	Leu	Asp	Ser	Val	Pro	Met	
		150					155					160				
gtc	gcc	atc	acg	ggc	cag	gtc	cac	cgc	cgc	atg	atc	ggc	acc	gac	gcc	584
Val	Ala	Ile	Thr	Gly	Gln	Val	His	Arg	Arg	Met	Ile	Gly	Thr	Asp	Ala	
	165					170					175					
ttc	cag	gag	acg	ссс	ata	gtc	gag	gtc	acc	cgc	tcc	atc	acc	aag	cac	632
Phe	Gln	Glu	Thr	Pro	Ile	Val	Glu	Val	Thr	Arg	Ser	Ile	Thr	Lys	His	
180					185					190					195	
					-											
aat	tac	ctt	gtc	ctt	gat	gtg	gag	gac	atc	ccc	cgc	gtc	ata	cag	gaa	680
Asn	Tyr	Leu	Val	Leu	Asp	Val	Glu	Asp	Ile	Pro	Arg	Val	Ile	Gln	Glu	
				200					205					210		
gcc	ttc	ttc	ctc	gcg	tcc	tcg	ggc	cgt	cct	ggc	ccg	gtg	ctg	gtc	gac	728
Ala	Phe	Phe	Leu	Ala	Ser	Ser	Gly	Arg	Pro	Gly	Pro	Val	Leu	Val	Asp	
			215					220					225			

atc ccc aag gac atc cag cag cag atg gcc gtg ccg gtc tgg gac acc

Ile Pro Lys Asp Ile Gln Gln Met Ala Val Pro Val Trp Asp Thr

tcg	atg	aat	cta	cca	ggg	tac	atc	gca	cgc	ctg	ccc	aag	cca	ccc	gcg	824
Ser	Met	Asn	Leu	Pro	Gly	Tyr	Ile	Ala	Arg	Leu	Pro	Lys	Pro	Pro	Ala	
	245					250					255					
aca	gaa	ttg	ctt	gag	cag	gtc	ttg	cgt	ctg	gtt	ggc	gag	tca	cgg	cgc	872
Thr	Glu	Leu	Leu	Glu	Gln	Val	Leu	Arg	Leu	Val	G1y	Glu	Ser	Arg	Arg	
260					265					270					275	
ccg	att	ctc	tat	gtc	ggt	ggt	ggc	tgc	tct	gca	tct	ggt	gac	gaa	ttg	920
Pro	Ile	Leu	Tyr	Val	Gly	Gly	Gly	Cys	Ser	Ala	Ser	Gly	Asp	Glu	Leu	
				280					285					290		
cgc	tgg	ttt	gtt	gag	ctg	act	ggt	atc	cca	gtt	aca	acc	act	ctg	atg	968
Arg	Trp	Phe	Val	Glu	Leu	Thr	Gly	Ile	Pro	Val	Thr	Thr	Thr	Leu	Met	
			295					300					305			
ggc	ctc	ggc	aat	ttc	ccc	agt	gac	gac	ccg	ttg	tcc	ctg	cgc	atg	ctt	1016
Gly	Leu	Gly	Asn	Phe	Pro	Ser	Asp	Asp	Pro	Leu	Ser	Leu	Arg	Met	Leu	
		310					315					320				
ggg	atg	cat	ggc	acg	gtg	tac	gca	aat	tat	gcc	gtg	gat	aag	gct	gac	1064
Gly	Met	His	Gly	Thr	Val	Tyr	Ala	Asn	Tyr	Ala	Val	Asp	Lys	Ala	Asp	
	325					330					335					
ctg	ttg	ctt	gcg	ttt	ggt	gtg	cgg	ttt	gat	gat	cgt	gtg	aca	ggg	aaa	1112
Leu	Leu	Leu	Ala	Phe	Gly	Val	Arg	Phe	Asp	Asp	Arg	Val	Thr	Gly	Lys	
340					345					350					355	

att	gag	gct	ttt	gca	agc	agg	gcc	aag	att	gtg	cac	att	gac	att	gat	1160
Ile	Glu	Ala	Phe	Ala	Ser	Arg	Ala	Lys	Ile	Val	His	Ile	Asp	Ile	Asp	
				360					365					370		
cca	gca	gag	att	gga	aag	aac	aag	caa	cca	cat	gtg	tca	att	tgc	gca	1208
Pro	Ala	Glu	Ile	Gly	Lys	Asn	Lys	Gln	Pro	His	Val	Ser	Ile	Cys	Ala	
			375					380					385			
gat	gtt	aag	ctt	gct	tta	cag	ggc	ttg	aat	gct	ctg	cta	caa	cag	agc	1256
Asp	Val	Lys	Leu	Ala	Leu	Gln	Gly	Leu	Asn	Ala	Leu	Leu	Gln	Gln	Ser	
		390					395					400				
aca	aca	aag	aca	agt	tct	gat	ttt	agt	gca	tgg	cac	aat	gag	ttg	gac	1304
Thr	Thr	Lys	Thr	Ser	Ser	Asp	Phe	Ser	Ala	Trp	His	Asn	Glu	Leu	Asp	
	405					410					415					
cag	cag	aag	agg	gag	ttt	cct	ctg	ggg	tac	aaa	act	ttt	ggt	gaa	gag	1352
Gln	G1n	Lys	Arg	Glu	Phe	Pro	Leu	Gly	Tyr	Lys	Thr	Phe	Gly	Glu	G1u	
420					425					430					435	
atc	cca	ccg	caa	tat	gcc	att	cag	gtg	ctg	gat	gag	ctg	acg	aaa	ggt	1400
Ile	Pro	Pro	G1n	Tyr	Ala	Ile	Gln	Val	Leu	Asp	Glu	Leu	Thr	Lys	Gly	
				440					445					450		
gag	gca	atc	atc	gct	act	ggt	gtt	ggg	cag	cac	cag	atg	tgg	gcg	gca	1448
Glu	Ala	Ile	Ile	Ala	Thr	Gly	Val	Gly	G1n	His	Gln	Met	Trp	Ala	Ala	
			455					460					465			

caa tat tac acc tac aag cgg cca cgg cag tgg ctg tct tcg gct ggt  $\phantom{0}$  1496  $\phantom{0}$  27/56

GIn	Tyr	Tyr	Thr	lyr	Lys	Arg	Pro	Arg	GIn	Irp	Leu	Ser	Ser	Ala	Gly	
		470					475					480				
ctg	ggc	gca	atg	gga	ttt	ggg	ctg	cct	gct	gca	gct	ggt	gct	tct	gtg	1544
Leu	Gly	Ala	Met	Gly	Phe	Gly	Leu	Pro	Ala	Ala	Ala	G1y	Ala	Ser	Val	
	485					490					495					
gct	aac	cca	ggt	gtc	aca	gtt	gtt	gat	att	gat	ggg	gat	ggt	agc	ttc	1592
Ala	Asn	Pro	Gly	Val	Thr	Val	Val	Asp	Ile	Asp	Gly	Asp	Gly	Ser	Phe	
500					505					510					515	
ctc	atg	aac	att	cag	gag	ctg	gca	ttg	atc	cgc	att	gag	aac	ctc	cct	1640
Leu	Met	Asn	Ile	Gln	Glu	Leu	Ala	Leu	Ile	Arg	Ile	Glu	Asn	Leu	Pro	
				520					525					530		
gtg	aag	gtg	atg	gtg	ttg	aac	aac	caa	cat	ttg	ggt	atg	gtg	gtg	caa	1688
Val	Lys	Val	Met	Val	Leu	Asn	Asn	Gln	His	Leu	Gly	Met	Val	Val	Gln	
			535					540					545			
tgg	gag	gat	agg	ttt	tac	aag	gcg	aat	agg	gcg	cat	aca	tac	ttg	ggc	1736
Trp	Glu	Asp	Arg	Phe	Tyr	Lys	Ala	Asn	Arg	Ala	His	Thr	Tyr	Leu	Gly	
		550					555					560				
aac	ccg	gaa	tgt	gag	agc	gag	ata	tat	cca	gat	ttt	gtg	act	att	gct	1784
Asn	Pro	Glu	Cys	Glu	Ser	Glu	Ile	Tyr	Pro	Asp	Phe	Val	Thr	Ile	Ala	
	565					570					575					
aag	ggg	ttc	aat	att	cct	gca	gtc	cgt	gta	aca	aag	aag	agt	gaa	gtc	1832
Lys	Gly	Phe	Asn	Ile	Pro	Ala	Val	Arg	Val	Thr	Lys	Lys	Ser	Glu	Val	

28/56

cgt gcc gcc atc aag aag atg ctc gag act cca ggg cca tac ttg ttg	1880
Arg Ala Ala Ile Lys Lys Met Leu Glu Thr Pro Gly Pro Tyr Leu Leu	
600 605 610	
gat atc atc gtc ccg cac cag gag cat gtg ctg cct atg atc cca att	1928
Asp Ile Ile Val Pro His Gln Glu His Val Leu Pro Met Ile Pro Ile	
615 620 625	
ggg ggc gca ttc aag gac atg atc ctg gat ggt gat ggc agg act gtg	1976
Gly Gly Ala Phe Lys Asp Met Ile Leu Asp Gly Asp Gly Arg Thr Val	
630 635 640	
tot tootototoo totatotatt aannoonno nomenana totattana.	2020
tat taatctataa totgtatgtt ggcaaagcac cagcooggco tatgtttgac Tyr	2029
ctgaatgacc cataaagagt ggtatgccta tgatgtttgt atgtgctcta tcaataacta	2089
aggtgtcaac tatgaaccat atgctcttct gttttacttg tttgatgtgc ttggcatggt	2149
aatcctaatt agcttcctgc tgtctaggtt tgtagtgtgt tgttttctgt aggcatatgc	2209
atcacaagat atcatgtaag tttcttgtcc tacatatcaa taataagaga ataaagtact	2269

tctatgtaaa aaaaaaaaaa aaaaa

<211> 644 <212> PRT <213> Oryza sativa var. kinmaze <400> 6 Met Ala Thr Thr Ala Ala Ala Ala Ala Ala Leu Ser Ala Ala Ala Thr Ala Lys Thr Gly Arg Lys Asn His Gln Arg His His Val Leu Pro Ala Arg Gly Arg Val Gly Ala Ala Ala Val Arg Cys Ser Ala Val Ser 35 · Pro Val Thr Pro Pro Ser Pro Ala Pro Pro Ala Thr Pro Leu Arg Pro Trp Gly Pro Ala Glu Pro Arg Lys Gly Ala Asp Ile Leu Val Glu Ala Leu Glu Arg Cys Gly Val Ser Asp Val Phe Ala Tyr Pro Gly Gly Ala Ser Met Glu Ile His Gln Ala Leu Thr Arg Ser Pro Val Ile Thr Asn 

His Leu Phe Arg His Glu Gln Gly Glu Ala Phe Ala Ala Ser Gly Tyr

	Arg	Ala	Ser	Gly	Arg	Val	Gly	Val	Cys	Val	Ala	Thr	Ser	Gly	Pro
	130					135					140				
Gly	ΔΊα	Thr	Acn	ا ما	Val	Sar	Δla	الم ا	Δla	Asn	Δla	Lan	ا م ا	Asp	Sar
	nia	1111	non	Lcu		501	MIG	LCu	nia		nia	Deu	Leu	изр	
145					150					155					160
Val	Pro	Met	Val	Ala	Ile	Thr	Gly	Gln	Val	His	Arg	Arg	Met	Ile	Gly
				165					170					175	
Thr	Asp	Ala	Phe	Gln	Glu	Thr	Pro	Ile	Val	Glu	Val	Thr	Arg	Ser	Ile
								185					190		
			180					100					190		
Thr	Lys	His	Asn	Tyr	Leu	Val	Leu	Asp	Val	Glu	Asp	Ile	Pro	Arg	Val
		195					200					205			
Ile	Gln	Glu	Ala	Phe	Phe	Leu	Ala	Ser	Ser	Gly	Arg	Pro	Gly	Pro	Val
	210					215					220				
1	17 7														
Leu		100	T10	Dro	Lwo	Aan	110	Cln	Gln.	Cln	Mot	۸۱۵	Vol	Dwo	Vo 1
	Val	Asp	Ile	Pro		Asp	Ile	Gln	Gln		Met	Ala	Val	Pro	
225	Val	Asp	Ile	Pro	Lys 230	Asp	Ile	Gln	Gln	Gln 235	Met	Ala	Val	Pro	Val 240
225	Val	Asp	Ile	Pro		Asp	Ile	Gln	Gln		Met	Ala	Val	Pro	
					230					235				Pro	240
					230					235					240
				Met	230				Tyr	235				Pro	240
Trp	Asp	Thr	Ser	Met 245	230 Asn	Leu	Pro	Gly	Tyr 250	235	Ala	Arg	Leu	Pro 255	240 Lys
Trp	Asp	Thr	Ser Thr	Met 245	230 Asn	Leu	Pro	Gly Gln	Tyr 250	235	Ala	Arg	Leu Val	Pro	240 Lys
Trp	Asp	Thr	Ser	Met 245	230 Asn	Leu	Pro	Gly	Tyr 250	235	Ala	Arg	Leu	Pro 255	240 Lys
Trp	Asp Pro	Thr	Ser Thr	Met 245 Glu	230 Asn Leu	Leu Leu	Pro Glu	Gly Gln 265	Tyr 250 Val	235 Ile Leu	Ala Arg	Arg Leu	Leu Val 270	Pro 255	240 Lys Glu

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Asp Glu Leu Arg Trp Phe Val Glu Leu Thr Gly Ile Pro Val Thr Thr
290 295 300

Thr Leu Met Gly Leu Gly Asn Phe Pro Ser Asp Asp Pro Leu Ser Leu 305 310 315 320

Arg Met Leu Gly Met His Gly Thr Val Tyr Ala Asn Tyr Ala Val Asp
325 330 335

Lys Ala Asp Leu Leu Leu Ala Phe Gly Val Arg Phe Asp Asp Arg Val
340 345 350

Thr Gly Lys Ile Glu Ala Phe Ala Ser Arg Ala Lys Ile Val His Ile 355 360 365

Asp Ile Asp Pro Ala Glu Ile Gly Lys Asn Lys Gln Pro His Val Ser 370 375 380

Ile Cys Ala Asp Val Lys Leu Ala Leu Gln Gly Leu Asn Ala Leu Leu 385 390 395 400

Gln Gln Ser Thr Thr Lys Thr Ser Ser Asp Phe Ser Ala Trp His Asn
405
410
415

Glu Leu Asp Gln Gln Lys Arg Glu Phe Pro Leu Gly Tyr Lys Thr Phe
420 425 430

Gly Glu Glu Ile Pro Pro Gln Tyr Ala Ile Gln Val Leu Asp Glu Leu 32/56

Thr	Lys	Gly	Glu	Ala	Ile	Ile	Ala	Thr	Gly	Val	Gly	Gln	His	Gln	Met
	450					455					460				

Trp Ala Ala Gln Tyr Tyr Thr Tyr Lys Arg Pro Arg Gln Trp Leu Ser 465 . 470 475 480

Ser Ala Gly Leu Gly Ala Met Gly Phe Gly Leu Pro Ala Ala Ala Gly
485 490 495

Ala Ser Val Ala Asn Pro Gly Val Thr Val Val Asp Ile Asp Gly Asp
500 505 510

Gly Ser Phe Leu Met Asn Ile Gln Glu Leu Ala Leu Ile Arg Ile Glu
515 520 525

Asn Leu Pro Val Lys Val Met Val Leu Asn Asn Gln His Leu Gly Met 530 535 540

Val Val Gln Trp Glu Asp Arg Phe Tyr Lys Ala Asn Arg Ala His Thr
545 550 555 560

Tyr Leu Gly Asn Pro Glu Cys Glu Ser Glu Ile Tyr Pro Asp Phe Val
565 570 575

Thr Ile Ala Lys Gly Phe Asn Ile Pro Ala Val Arg Val Thr Lys Lys
580 585 590

Ser Glu Val Arg Ala Ala Ile Lys Lys Met Leu Glu Thr Pro Gly Pro
595 600 605

Tyr Leu Leu Asp Ile Ile Val Pro His Gln Glu His Val Leu Pro Met 610 620

Ile Pro Ile Gly Gly Ala Phe Lys Asp Met Ile Leu Asp Gly Asp Gly 625 630 635 640

Arg Thr Val Tyr

<210> 7

<211> 2294

<212> DNA

<213> Oryza sativa var. kinmaze

<220>

<221> CDS

<222> (48).. (1979)

<400> 7

cccaaaccca gaaaccctcg ccgccgccgc cgccgccacc acccacc atg gct acg 56

Met Ala Thr

1

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acc	ggc	cgt	aag	aac	cac	cag	cga	cac	cac	gtc	ctt	ссс	gct	cga	ggc	152
Thr	Gly	Arg	Lys	Asn	His	Gln	Arg	His	His	Val	Leu	Pro	Ala	Arg	Gly	
20					25					30					35	
cgg	gtg	ggg	gcg	gcg	gcg	gtc	agg	tgc	tcg	gcg	gtg	tcc	ccg	gtc	acc	200
Arg	Val	Gly	Ala	Ala	Ala	Val	Arg	Cys	Ser	Ala	Val	Ser	Pro	Val	Thr	
				40					45					50		
ccg	ccg	tcc	ccg	gcg	ccg	ccg	gcc	acg	ccg	ctc	cgġ	ccg	tgg	ggg	ccg	248
Pro	Pro	Ser	Pro	Ala	Pro	Pro	Ala	Thr	Pro	Leu	Arg	Pro	Trp	G1y	Pro	
			55					60					65			
gcc	gag	ccc	cgc	aag	ggc	gcg	gac	atc	ctc	gtg	gag	gcg	ctg	gag	cgg	296
Ala	Glu	Pro	Arg	Lys	Gly	Ala	Asp	Ile	Leu	Val	Glu	Ala	Leu	Glu	Arg	
		70					75					80				
tgc	ggc	gtc	agc	gac	gtg	ttc	gcc	tac	ccg	ggc	ggc	gcg	tcc	atg	gag	344
Cys	Gly	Val	Ser	Asp	Val	Phe	Ala	Tyr	Pro	Gly	Gly	Ala	Ser	Met	Glu	
	85					90					95					
atc	cac	cag	gcg	ctg	acg	cgc	tcc	ccg	gtc	atc	acc	aac	cac	ctc	ttc	392
Ile	His	Gln	Ala	Leu	Thr	Arg	Ser	Pro	Val	Ile	Thr	Asn	His	Leu	Phe	
100					105					110					115	
cgc	cac	gag	cag	ggc	gag	gcg	ttc	gcg	gcg	tcc	ggg	tac	gcg	cgc	gcg	440
Arg	His	Glu	Gln	Gly	Glu	Ala	Phe	Ala	Ala	Ser	Gly	Tyr	Ala	Arg	Ala	
				120					125					130		
								35/56	5							

tcc	ggc	cgc	gtc	ggg	gtc	tgc	gtc	gcc	acc	tcc	ggc	ccc	ggg	gca	acc	488
Ser	Gly	Arg	Val	Gly	Val	Cys	Val	Ala	Thr	Ser	Gly	Pro	Gly	Ala	Thr	
			135					140					145			
aac	ctc	gtg	tcc	gcg	ctc	gcc	gac	gcg	ctg	ctc	gac	tcc	gtc	ccg	atg	536
Asn	Leu	Val	Ser	Ala	Leu	Ala	Asp	Ala	Leu	Leu	Asp	Ser	Val	Pro	Met	
		150					155					160				
							•									
gtc	gcc	atc	acg	ggc	cag	gtc	cac	cgc	cgc	atg	atc	ggc	acc	gac	gcc	584
Val	Ala	Ile	Thr	Gly	Gln	Val	His	Arg	Arg	Met	Ile	Gly	Thr	Asp	Ala	
	165					170					175					
ttc	cag	gag	acg	ccc	ata	gtc	gag	gtc	acc	cgc	tcc	atc	acc	aag	cac	632
Phe	Gln	Glu	Thr	Pro	Ile	Val	Glu	Val	Thr	Arg	Ser	Ile	Thr	Lys	His	
180					185					190					195	
aat	tac	ctt	gtc	ctt	gat	gtg	gag	gac	atc	ccc	cgc	gtc	ata	cag	gaa	680
Asn	Tyr	Leu	Val	Leu	Asp	Val	Glu	Asp	Ile	Pro	Arg	Val	Ile	Gln	Glu	
				200					205					210		
gcc	ttc	ttc	ctc	gcg	tcc	tcg	ggc	cgt	cct	ggc	ccg	gtg	ctg	gtc	gac	728
Ala	Phe	Phe	Leu	Ala	Ser	Ser	Gly	Arg	Pro	Gly	Pro	Val	Leu	Val	Asp	
			215					220					225			
atc	ссс	aag	gac	atc	cag	cag	cag	atg	gcc	gtg	ccg	gtc	tgg	gac	acc	776
Ile	Pro	Lys	Asp	Ile	Gln	Gln	Gln	Met	Ala	Val	Pro	Val	Trp	Asp	Thr	
		230					235					240				

tcg	atg	aat	cta	cca	ggg	tac	atc	gca	cgc	ctg	ccc	aag	cca	ссс	gcg	824
Ser	Met	Asn	Leu	Pro	Gly	Tyr	Ile	Ala	Arg	Leu	Pro	Lys	Pro	Pro	Ala	
	245					250					255					
aca	gaa	ttg	ctt	gag	cag	gtc	ttg	cgt	ctg	gtt	ggc	gag	tca	cgg	cgc	872
Thr	Glu	Leu	Leu	Glu	Gln	Val	Leu	Arg	Leu	Val	Gly	Glu	Ser	Arg	Arg	
260					265					270					275	
ccg	att	ctc	tat	gtc	ggt	ggt	ggc	tgc	tct	gca	tct	ggt	gac	gaa	ttg	920
	Ile															
			-	280				•	285				•	290		
cgc	tgg	ttt	gtt	gag	ctg	act	ggt	atc	cca	gtt	aca	acc	act	ctg	atg	968
_	Trp															
0	1		295				,	300					305			
ggc	ctc	ggc.	aat.	ttc	ccc	agt.	gac	gac	CCE	t.t.g	tee	ctg	cgc	atø	ctt	1016
	Leu															1010
01)	Lou	310				501	315			200	001	320	8		Beu	
		010					010					020				
aaa	atg	cat	aac	aca	ata	tac	aca	aat	tat	acc	ata	aat	220	act		1064
	Met															1004
Gly	325	1112	Oly	1111	vai	330	Ala	лы	1 9 1	піа		лър	Lys	піа	nsp	
	320					330					335					
		- 4-4							4.							1110
	ttg															1112
	Leu	Leu	Ala	Phe		Val	Arg	Phe	Asp		Arg	Val	Thr	Gly		
340					345					350					355	
att	gag	gct	ttt	gca	agc	agg	gcc	aag	att	gtg	cac	att	gac	att	gat	1160

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Ile	Glu	Ala	Phe	Ala	Ser	Arg	Ala	Lys	Ile	Val	His	Ile	Asp	Ile	Asp	
				360					365					370		
cca	gca	gag	att	gga	aag	aac	aag	caa	cca	cat	gtg	tca	att	tgc	gca	1208
Pro	Ala	Glu	Ile	Gly	Lys	Asn	Lys	Gln	Pro	His	Val	Ser	Ile	Cys	Ala	•
			375					380					385			
gat	gtt	aag	ctt	gct	tta	cag	ggc	ttg	aat	gct	ctg	cta	caa	cag	agc	1256
Asp	Val	Lys	Leu	Ala	Leu	Gln	Gly	Leu	Asn	Ala	Leu	Leu	Gln	Gln	Ser	
		390					395					400				
aca	aca	aag	aca	agt	tct	gat	ttt	agt	gca	tgg	cac	aat	gag	ttg	gac	1304
Thr	Thr	Lys	Thr	Ser	Ser	Asp	Phe	Ser	Ala	Trp	His	Asn	Glu	Leu	Asp	
	405					410					415					
cag	cag	aag	agg	gag	ttt	cct	ctg	ggg	tac	aaa	act	ttt	ggt	gaa	gag	1352
Gln	Gln	Lys	Arg	Glu	Phe	Pro	Leu	G1y	Tyr	Lys	Thr	Phe	Gly	Glu	Glu	
420					425					430					435	
atc	cca	ccg	caa	tat	gcc	att	cag	gtg	ctg	gat	gag	ctg	acg	aaa	ggt	1400
Ile	Pro	Pro	Gln	Tyr	Ala	Ile	Gln	Val	Leu	Asp	Glu	Leu	Thr	Lys	Gly	
				440					445					450		
gag	gca	atc	atc	gct	act	ggt	gtt	ggg	cag	cac	cag	atg	tgg	gcg	gca	1448
Glu	Ala	Ile	Ile	Ala	Thr	Gly	Val	Gly	Gln	His	Gln	Met	Trp	Ala	Ala	
			455					460					465			
caa	tat	tac	acc	tac	aag	cgg	cca	cgg	cag	tgg	ctg	tct	tcg	gct	ggt	1496
Gln	Tvr	Tvr	Thr	Tvr	Lvs	Arg	Pro	Arg	Gln	Trn	Leu	Ser	Ser	Ala	G1 v	

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ctg	ggc	gca	atg	gga	ttt	ggg	ctg	cct	gct	gca	gct	ggt	gct	tct	gtg	1544
Leu	Gly	Ala	Met	Gly	Phe	Gly	Leu	Pro	Ala	Ala	Ala	Gly	Ala	Ser	Val	
	485					490					495					
gct	aac	cca	ggt	gtc	aca	gtt	gtt	gat	att	gat	ggg	gat	ggt	agc	ttc	1592
Ala	Asn	Pro	Gly	Val	Thr	Val	Val	Asp	Ile	Asp	G1y	Asp	Gly	Ser	Phe	
500				٠	505					510					515	
ctc	atg	aac	att	cag	gag	ctg	gca	ttg	atc	cgc	att	gag	aac	ctc	cct	1640
Leu	Met	Asn	Ile	Gln	Glu	Leu	Ala	Leu	Ile	Arg	Ile	Glu	Asn	Leu	Pro	
				520					525					530		
gtg	aag	gtg	atg	gtg	ttg	aac	aac	caa	cat	ttg	ggt	atg	gtg	gtg	caa	1688
Val	Lys	Val	Met	Val	Leu	Asn	Asn	Gln	His	Leu	Gly	Met	Val	Val	Gln	
			535					540					545			
ttg	gag	gat	agg	ttt	tac	aag	gcg	aat	agg	gcg	cat	aca	tac	ttg	ggc	1736
Leu	Glu	Asp	Arg	Phe	Tyr	Lys	Ala	Asn	Arg	Ala	His	Thr	Tyr	Leu	Gly	
		550					555					560				
							•									
aac	ccg	gaa	tgt	gag	agc	gag	ata	tat	cca	gat	ttt	gtg	act	att	gct	1784
Asn	Pro	Glu	Cys	Glu	Ser	Glu	Ile	Tyr	Pro	Asp	Phe	Val	Thr	Ile	Ala	
	565					570					575					
aag	ggg	ttc	aat	att	cct	gca	gtc	cgt	gta	aca	aag	aag	agt	gaa	gtc	1832
Lys	Gly	Phe	Asn	Ile	Pro	Ala	Val	Arg	Val	Thr	Lys	Lys	Ser	Glu	Val	

cgt gcc gcc atc aag aag atg ctc gag act cca ggg cca t	ac ttg ttg 1880
Arg Ala Ala Ile Lys Lys Met Leu Glu Thr Pro Gly Pro T	yr Leu Leu
600 605	610
gat atc atc gtc ccg cac cag gag cat gtg ctg cct atg a	tc cca att 1928
Asp Ile Ile Val Pro His Gln Glu His Val Leu Pro Met I	le Pro Ile
615 620 63	25
ggg ggc gca ttc aag gac atg atc ctg gat ggt gat ggc a	
Gly Gly Ala Phe Lys Asp Met Ile Leu Asp Gly Asp Gly As	rg Thr Val
630 635 640	
	++
tat taatctataa tctgtatgtt ggcaaagcac cagcccggcc tatgt	ttgac 2029
Tyr	
ctgaatgacc cataaagagt ggtatgccta tgatgtttgt atgtgctct;	a tcaataacta 2089
aggtgtcaac tatgaaccat atgctcttct gttttacttg tttgatgtg	c ttggcatggt 2149
aatcctaatt agcttcctgc tgtctaggtt tgtagtgtgt tgttttctg	t aggcatatgc 2209
atcacaagat atcatgtaag tttcttgtcc tacatatcaa taataagaga	a ataaagtact 2269
tctatgtaaa aaaaaaaaa aaaaa	2294

<210> 8

<211> 644

<212> PRT

<213> Oryza sativa var. kinmaze

<400> 8

Met Ala Thr Thr Ala Ala Ala Ala Ala Ala Leu Ser Ala Ala Ala 1 1 5 10 15

Thr Ala Lys Thr Gly Arg Lys Asn His Gln Arg His His Val Leu Pro
20 25 30

Ala Arg Gly Arg Val Gly Ala Ala Ala Val Arg Cys Ser Ala Val Ser

35 40 45

Pro Val Thr Pro Pro Ser Pro Ala Pro Pro Ala Thr Pro Leu Arg Pro 50 55 60

Trp Gly Pro Ala Glu Pro Arg Lys Gly Ala Asp Ile Leu Val Glu Ala
65 70 75 80

Leu Glu Arg Cys Gly Val Ser Asp Val Phe Ala Tyr Pro Gly Gly Ala

85 90 95

Ser Met Glu Ile His Gln Ala Leu Thr Arg Ser Pro Val Ile Thr Asn 100 105 110

His Leu Phe Arg His Glu Gln Gly Glu Ala Phe Ala Ala Ser Gly Tyr
115 120 125

Ala Arg Ala Ser Gly Arg Val Gly Val Cys Val Ala Thr Ser Gly Pro 41/56 130 135 140

Gly Ala Thr Asn Leu Val Ser Ala Leu Ala Asp Ala Leu Leu Asp Ser 145 150 155 160

Val Pro Met Val Ala Ile Thr Gly Gln Val His Arg Arg Met Ile Gly
165 170 175

Thr Asp Ala Phe Gln Glu Thr Pro Ile Val Glu Val Thr Arg Ser Ile 180 185 190

Thr Lys His Asn Tyr Leu Val Leu Asp Val Glu Asp Ile Pro Arg Val
195 200 205

Ile Gln Glu Ala Phe Phe Leu Ala Ser Ser Gly Arg Pro Gly Pro Val
210 215 220

Leu Val Asp Ile Pro Lys Asp Ile Gln Gln Gln Met Ala Val Pro Val 225 230 235 240

Trp Asp Thr Ser Met Asn Leu Pro Gly Tyr Ile Ala Arg Leu Pro Lys
245 250 255

Pro Pro Ala Thr Glu Leu Leu Glu Gln Val Leu Arg Leu Val Gly Glu 260 265 270

Ser Arg Arg Pro Ile Leu Tyr Val Gly Gly Gly Cys Ser Ala Ser Gly
275 280 285

Asp Glu Leu Arg Trp Phe Val Glu Leu Thr Gly Ile Pro Val Thr Thr Thr Leu Met Gly Leu Gly Asn Phe Pro Ser Asp Asp Pro Leu Ser Leu Arg Met Leu Gly Met His Gly Thr Val Tyr Ala Asn Tyr Ala Val Asp Lys Ala Asp Leu Leu Ala Phe Gly Val Arg Phe Asp Asp Arg Val Thr Gly Lys Ile Glu Ala Phe Ala Ser Arg Ala Lys Ile Val His Ile Asp Ile Asp Pro Ala Glu Ile Gly Lys Asn Lys Gln Pro His Val Ser Ile Cys Ala Asp Val Lys Leu Ala Leu Gln Gly Leu Asn Ala Leu Leu Gln Gln Ser Thr Thr Lys Thr Ser Ser Asp Phe Ser Ala Trp His Asn Glu Leu Asp Gln Gln Lys Arg Glu Phe Pro Leu Gly Tyr Lys Thr Phe 

Gly Glu Glu Ile Pro Pro Gln Tyr Ala Ile Gln Val Leu Asp Glu Leu

Thr Lys Gly Glu Ala Ile Ile Ala Thr Gly Val Gly Gln His Gln Met
450 455 460

Trp Ala Ala Gln Tyr Tyr Thr Tyr Lys Arg Pro Arg Gln Trp Leu Ser 465 470 475 480

Ser Ala Gly Leu Gly Ala Met Gly Phe Gly Leu Pro Ala Ala Gly
485 490 495

Ala Ser Val Ala Asn Pro Gly Val Thr Val Val Asp Ile Asp Gly Asp
500 505 510

Gly Ser Phe Leu Met Asn Ile Gln Glu Leu Ala Leu Ile Arg Ile Glu
515 520 525

Asn Leu Pro Val Lys Val Met Val Leu Asn Asn Gln His Leu Gly Met 530 540

Val Val Gln Leu Glu Asp Arg Phe Tyr Lys Ala Asn Arg Ala His Thr 545 550 555 560

Tyr Leu Gly Asn Pro Glu Cys Glu Ser Glu Ile Tyr Pro Asp Phe Val
565 570 575

Thr Ile Ala Lys Gly Phe Asn Ile Pro Ala Val Arg Val Thr Lys Lys
580 585 590

Ser Glu Val Arg Ala Ala Ile Lys Lys Met Leu Glu Thr Pro Gly Pro 44/56

595 600 605

Tyr Leu Leu Asp Ile Ile Val Pro His Gln Glu His Val Leu Pro Met 610 615 620

Ile Pro Ile Gly Gly Ala Phe Lys Asp Met Ile Leu Asp Gly Asp Gly 625 630 635 640

Arg Thr Val Tyr

<210> 9

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:primer

<400> 9

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21

<210> 10

<211> 21

<212> DNA

<213> Artificial Sequence

<220>	
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agtcctgcca tcaccatcca g	21
<210> 11	
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<212> DNA	
<213> Artificial Sequence	
⟨220⟩	
<223> Description of Artificial	Sequence:primer
<400> 11	
ctgggacacc tcgatgaat	19
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⟨210⟩ 12	
⟨211⟩ 25	
<212> DNA	
<213> Artificial Sequence	
<220>	
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caacaaacca gcgcaattcg tcacc

<210> 13	
⟨211⟩ 18	
<212> DNA	
<213> Artificial Sequence	
⟨220⟩	
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catcaccaac cacctctt	18
⟨210⟩ 14	
⟨211⟩ 21	
<212> DNA	
<213> Artificial Sequence	
⟨220⟩	
<223> Description of Artificial	Sequence: primer
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<210> 15	
<211> 16	

<212> DNA

<213>	Artificial Sequence	
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<210>	16	
<211>	22	
<212>	DNA	
<213>	Artificial Sequence	
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<223>	Description of Artificial Sequence:primer	
(400)		
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cagcgacgtg ttcgccta

18

<210> 18

<211> 18

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:primer

<400> 18

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18

<210> 19

<211> 18

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:primer

<400> 19

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18

<210> 20

<211> 1	8
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<213> A	rtificial Sequence
⟨220⟩	
<223> D	escription of Artificial Sequence:primer
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<210> 2	1
<211> 1	7
<212> D	NA
<213> A	rtificial Sequence
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<223> D	escription of Artificial Sequence:primer
<400> 2	
gcatctt	ctt gatggcg 17
<210> 2	n
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(223) Description of Artificial Sequence.primer	
<400> 22	
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<210> 23	
<211> 17	
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⟨220⟩	
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aggtgtcaca gttgttg	17

<210> 2	25	
<211>	17	
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<212> I		
(213) F	Artificial Sequence	
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<400> 2	26	
gctttgc	ccaa catacag	17
<210> 2	27	
<211> 1	17	•
<212> I	DNA	
<213> A	Artificial Sequence	

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17

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:primer

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